

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
13 January 2005 (13.01.2005)

PCT

(10) International Publication Number
WO 2005/002436 A1

(51) International Patent Classification⁷: **A61B 5/103**,
5/04, A63B 24/00

(21) International Application Number:
PCT/AU2004/000839

(22) International Filing Date: 25 June 2004 (25.06.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
2003903347 1 July 2003 (01.07.2003) AU
2004902053 16 April 2004 (16.04.2004) AU

(71) Applicants (*for all designated States except US*):
QUEENSLAND UNIVERSITY OF TECHNOLOGY
[AU/AU]; Gardens Point Campus, 2 George Street,
Brisbane, QLD 4000 (AU). **WORRINGHAM, Charles**
[AU/AU]; c/- Queensland University of Technology,
School of Human Movement Studies, Victoria Park Road,
Kelvin Grove, QLD 4059 (AU).

(72) Inventors; and

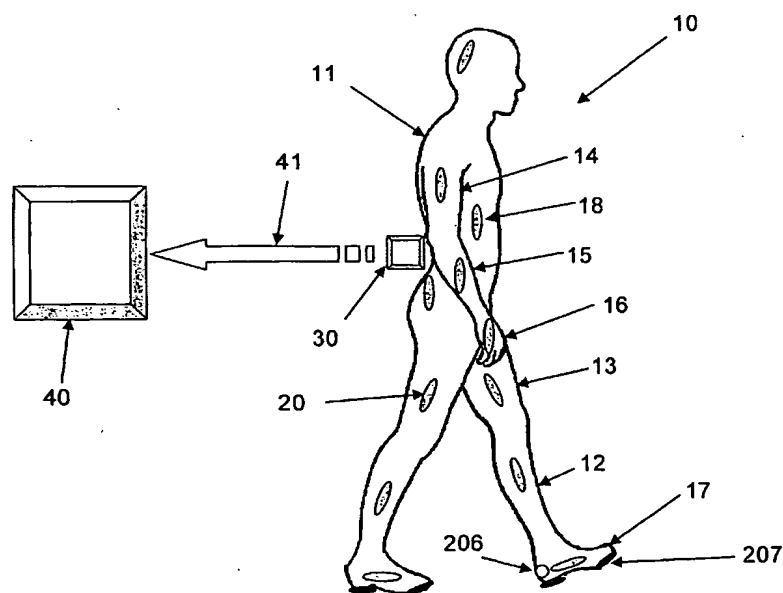
(75) Inventors/Applicants (*for US only*): **JASIEWICZ, Jan** [AU/AU]; c/- Queensland University of Technology, School of Human Movement Studies, Victoria Park Road, Kelvin Grove, QLD 4059 (AU). **CONDIE, Peter** [AU/AU]; c/- Queensland University of Technology, School of Human Movement Studies, Victoria Park Road, Kelvin Grove, QLD 4059 (AU). **BARRISKILL, Andrew** [AU/AU]; c/- 14 Mars Road, Lane Cove, NSW 2066 (AU). **CURCIC, Branka** [AU/AU]; c/- 14 Mars Road, Lane Cove, NSW 2066 (AU). **DUNCAN, Michael** [AU/AU]; c/- 14 Mars Road, Lane Cove, NSW 2066 (AU). **PARKER, Simon** [AU/AU]; c/- 14 Mars Road, Lane Cove, NSW 2066 (AU). **PARKER, Tony** [—/AU]; Queensland University of Technology, School of Human Movement Studies, Victoria Park Road, Kelvin Grive, Queensland 4059 (AU).

(74) Agent: **FISHER ADAMS KELLY**; PO Box 1413, Brisbane, QLD 4000 (AU).

(81) Designated States (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,

[Continued on next page]

(54) Title: MOTION MONITORING AND ANALYSIS SYSTEM



(57) Abstract: A motion analysis system (10) in which sensor elements (20) attached to movable *body* segments record movement parameters including angular velocity and acceleration. A control device (40) receives the movement parameters and determines an overall motion of the movable body segments. The overall motion is analysed against an acceptable motion model to determine whether the overall motion is within acceptable limits. The sensor elements (20) and control device (40) are lightweight and can be worn during normal movement activities thereby allowing monitoring of work-based activities, such as lifting or typing. The invention is useful for detecting and correcting problems leading to lower back disorders and repetitive strain injuries.



GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

(84) **Designated States** (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.